Virginia WILDLIFE

JULY, 1954

VOLUME XV Price 15 cents NUMBER 7

ORDER and BALANCE

THE STORY GOES that a contractor invited a neighboring preacher to a show one afternoon to witness the efficiency of the latest heavy earth-moving equipment.

"We got a job to do on a cleared lot, Parson," he said "and I want you to come over and see a sight. We're going to see how long it takes our new bulldozer to rip out a big oak stump."

The preacher came. The show went on. The huge oak stump was persistent. But the 'dozer was too much. In a very short time the six-foot oak stump gave up its binding hold on Mother Earth and, like a disgorged tentacled giant, lay uprooted before the crowd.

"Seven minutes to a second," spouted the contractor. "How do you like that for power? Ain't that progress?"

Well, the preacher couldn't help being marveled at the sight. "Yes, it's sheer power all right . . ." and then he reflected for a moment. "Power, yes. But have you ever stopped to think of the progress angle? Is it really progress? Here in seven short minutes you have upheaved a forest giant which took Nature 300 long years to build." And so we have a moral, a very good moral to draw on today.

Just a little over 300 years ago, the age of the oak stump, —a mighty short space of time in a world known for only 9000 years of organized society but eons of geologic time—America was an Eldorado of plant and animal life. Vegetation covered the continent. In the rainbelt areas virgin forests stood in majestic glory. Some trees, like the sequoias of the lower Sierras, grew well past the remarkable ripe age of 4000 years. Others simply got old and toppled over in the wind. Where rainfall was less, the earth was carpeted with prairie grasses and sedges and chaparral which, like the forests of the coastal areas and other wet zones, helped to bind Mother Earth together and kept it from being washed to the sea.

So extraordinarily plush in vegetation was the North American continent that early trappers, voyagers, and discoverers were overwhelmed by what they saw and wrote glowing accounts of the richness of the forests, the plains, the water areas, the land. The food resources of the ocean seemed inexhaustible, they said; the clouds of waterfowl boundless; the trees so thick you could drive a wagon through. Furbearing mammals, deer, bear, wild turkey, and many other forms of wildlife were so abundant as to be beyond the wildest dreams of any living man.

Our forefathers of course had no idea of how quickly an expanding human population could outdo the supplies of nature. Few, very few indeed, had any idea of safeguarding resources for the future. Why should they? Were not these things "limitless"?

Well, we know better today. We know that a different course should have been followed. We know the story now—the denuded and cutover and burned forests, soil wasted and sapped of its strength, water muddied and poisoned and uncontrolled, wildlife persecuted and hunted and destroyed to the tune of 15 extinct species, new and constant danger to 44 others.

Generations ago citizens knew little about the complex laws of nature—the multiple ties between all living things and the inanimate things like soil, which showed that an unhealthy condition in one segment of nature would eventually do harm to all others.

At the turn of the present century scientific forestry was a new concept; lumber was still cheap and plentiful; soil and water problems were hardly recognized as national problems; guns and new ammunition and the horseless carriage had not yet made too severe inroads on our wildlife; few people had ever thought of land management, forest fire control, game refuges, soil classification, climatic changes in relation to land use; furthermore, the word conservation had but a vague meaning.

Then came men like Teddy Roosevelt, Pinchot, Colonel Greeley, Fearnow, Leopold, Bennett, Gabrielson—men with vision who sacrificed themselves for a cause, for a crusade to make America wise resource use conscious—and the era of a new type of thinking commenced.

Today the true and broad meaning of conservation is becoming a part of the awareness of every man, woman, and child in daily life. To understand how a tree grows or how the water table works in the ground or how animal life is involved in the complex order of things is being slowly recognized as important in basic education. Balance and order and wise use in our earth's abundance is gradually—though still painfully slow to conservationists—being accepted as a new pattern in our thinking.

Yes, young people, in fact all of us, must learn the relation between air, sunlight, plants, animals, minerals, water, and man. We must realize that man can work with nature, not against her. Youngsters must be taught that democracy is a system of government by the will of the people and that the good of everyone must transcend what is good for the individual. The concept of greatest good for the greatest number for the longest time must be applied to everyone and everything—including our resources—if we are to keep our way of life.

Through eons of time, nature had done a superb job of maintaining order and harmony in America without interference from man. America was God-blessed with natural wealth. There came a rich empire. It grew out of the sum and substance of the good earth itself. But in the process, nature's harmony has been upset. During the life of the big oak, nature's unbalance has gained dangerous proportions. There must be a stopping point. The bulldozer must be put to constructive use. We can ill afford further waste. We can ill afford further wanton disturbance of our national wealth. A return to balance and order is needed, for it is only in that balance—in that God-given order—wherein we can ever hope to find our great destiny as a nation.—J. J. S.

The Story of The Wildlife Refuge Program

By JAY N. DARLING
Former Chief, U. S. Biological Survey
Cartoons by the author

A HOWL of derisive and ribald criticism greeted President Franklin D. Roosevelt's newly appointed Duck Committee on the morning of our arrival for our first meeting in Washington.

This was in mid-December, 1934, after a frighteningly disastrous season for all migratory waterfowl. Duck hunters, wildlife conservationists and sporting arms and ammunition manufacturers were raising such a hullabaloo that the President, in an effort to dodge the political brickbats and dead cats being hurled at the United States Biological Survey in particular and the administration and Congress in general, had named a committee of three civilian strangers on which he unloaded the problem. The outdoor writers and sports pages were particularly outspoken. One commentator pointed out that the political medicine-makers were happy that the hot end of the poker had been transferred to the hands of three inexperienced tenderfeet, a comment the significance of which we, the committee members, did not fully appreciate at the time.

After the shock of that reception, we needed a little encouragement, but President Franklin D. Roosevelt was sorry to be so very busy that he could not see us just then. Except for the cordial welcome extended by Henry Wallace, Secretary of Agriculture, it seemed that we were condemned from the start, individually and collectively. Mr. Wallace, however, loaned us a spare room and some chairs and a table, and at F. D. R.'s request, turned over to the committee an accumulation of White House mail containing advice and recommendations for the restoration of the waterfowl. We studied and discussed them all, but for the most part, they were quite impractical. The letters contained a dozen variations of the suggestion to "hatch millions of wild ducks in electric incubators and turn the ducklings loose as soon as they could fly."

Before we had been called to Washington, the members of the committee were aware of the many efforts of independent sportsmen of means and a goodly number of plush duck clubs who, while opposed to any restrictions on their shooting privileges, were nevertheless showing considerable anxiety over the declining duck population. Their sporadic efforts to find a simple home remedy had been publicized extensively in the hope of attracting wide cooperation.

A privately supported organization known as "More Game Birds in America," with an expensive technical staff largely financed by the aforementioned Joseph P. Knapp, owner of Crowell Publishing Company, a fabulous sportsman, made a determined effort at considerable cost to replenish the depleted ranks of wild ducks by artificial methods. Knapp was not one to spare the horses, and every possible device was used in his hatcheries. Unfortunately the off-spring from his breeding farms looked upon anyone in a khaki uniform as a free meal ticket and hastened to flock around him, even alighting on his shoulders whenever they spied a hunter in sedge-colored clothes. The best thing Knapp's early organization ever hatched was "Ducks Unlimited," which is doing in Canada what the U. S. Fish and Wildlife Service is doing on this side of the border.

James M. Bell, of Minneapolis, a man with considerably more understanding than most, set up a research unit in Canada to determine the breeding, feeding and flight habits of the canvasback and redhead ducks. Later he turned it over to the Wildlife Management Institute and the Fish and Wildlife Service, after a completely convincing series of experiments which proved that nature in her vast domain, if left reasonably alone, could do a better job of replenishing the supply of wild ducks than man.

The possibilities of putting water back on the artifically drained and dried up duck nesting marshes as a means of replenishing the fading wild duck population had not appeared in any of the letters to the President. One letter, however, that had come addressed to the committee, in care of Henry Wallace, was from an ex-fish and game commissioner of North Dakota. The letter was explicit. There were, in all, one and a quarter million acres of fine old duck marshes north of Minot, North Dakota, which now had nothing left on them but cockleburs and bankrupt farmers. It was a generally accepted opinion that the land had proved worthless for farming and that there would be no objection to plugging up the outlets of the drainage ditches and holding back the waters from the melting winter snows and spring rains, if any. By so doing, a benevolent service would be performed by rescuing the farmers from the cropless, hayless, dried-up slough bottoms and holding back the spring run-off from flooding the main streets of Minot. If it also proved beneficial to the ducks, so much the better. By starting work right away, the ex-commissioner thought some of the old duck marshes could be at least partly restored for the coming spring's nesting season.

That was the most practical idea which had yet been presented to the Duck Committee and if the ex-conservation commissioner of North Dakota could furnish so good

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This concludes the amazing account of "Ding's" two years struggle to launch the wildlife refuge system, Part 1 of which appeared in our foregoing June issue. Both parts have been condensed. Credit is due the *National Parks Magazine* and Mr. Darling for permission to reprint the article.—Editor.

There were millions, but not one penny for wildlife restoration.

a prospect for easy restoration, why not question other fish and game or conservation commissioners in other duck nesting areas?

A series of letters was therefore promptly sent out by our committee stating our objectives and asking cooperation in locating suitable restoration projects where wild ducks had traditionally nested and water was available for reflooding. The response was electrifying and enthusiastic from almost all of the northern border states to whom our letters had gone. There must have been, out of that brief exchange of letters, a half dozen fairly well documented projects which came in by return mail.

The pattern of restoration projects designed for the northern border states had hardly had time to reach the public before we were bombarded with complaints by mail, wires and personal visitations. What's the matter with Kansas? What's the matter with Wyoming? What's the matter with Utah—Illinois—Maine—Missouri, etc. States which had not been included in our former pattern called upon their congressional delegations to look into the matter.

Thus, the Mouse River project sent in by the ex-fish and game commissioner of North Dakota snowballed into a nationwide avalanche which made the large wall map in our temporary quarters, on which we placed tacks to designate recommended projects, look more like a double-barrelled shotgun pattern than it did like an emergency rescue mission, for which our committee had originally been appointed.

By the end of the fifth week we had fairly well documented projects listed favorably for further investigation in forty-six of the forty-eight states. The longer we put off turning in our report the more ponderous the list of excess projects would appear. It seemed a good time to stop, write our report and go home. On that point the three members of the committee thoroughly agreed.

In the fast-moving assembly of our project lists, there had been no occasion to clash over matters of principle or personal prejudices. The report should emphasize the primary necessity for restored nesting environment, but the rest of the projects, with secondary rating and outside the traditional summer breeding range, were only included in the file to comply with the President's request for "no favoritism." After that, the committee fell apart with all the violence of an exploding powder magazine.

Small difference it ever made, because the President never read either report. The bitterness engendered in the final committee session never came to light, but the listing of the recommended projects in our press release apparently met with general public approval. There followed a brief period of silent expectancy, while the President was supposed to be digesting the recommendations. The silence became oppressive.

A Washington news man was requested to needle the President at the next press conference. "What has become of the Duck Committee report?" . . . F. D. R. hesitated—"Um . . . ah," said the President, and looked at McIntire, his press secretary. McIntire's face was a blank. Finally the President said he had only seen the account that had appeared in the newspapers. There were widespread repercussions from that remark. McIntire was reported later to have found the report still unopened and evidently unread, buried under a pile of reading matter on the table at the head of F. D. R.'s bed.

The members of the committee, who were hardly on speaking terms with each other, and who had paid their own expenses while on the Washington assignment, because no one had volunteered to pick up the tab, were in no mood for further participation in the complicated political mess. We had neither authority nor funds to implement the program we had set up.

I was called back to Washington and urged to take over the directorship of the Biological Survey, and to carry out the project recommendations of the committee report.

I certainly did not want the job. The Bureau of Biological Survey had no money for even routine operations, to say nothing of wide expansion.

I accepted conditionally, however, reminding F. D. R. of his promise of $1,000,000 for operations, without which nothing could be done; and I received in return one of

I received in return one of his gorgeous smiles.

his gorgeous smiles, and he held out a package of Camel's, saying as he did so, "Let's smoke a good cigarette on it."—What a simpleton I was!

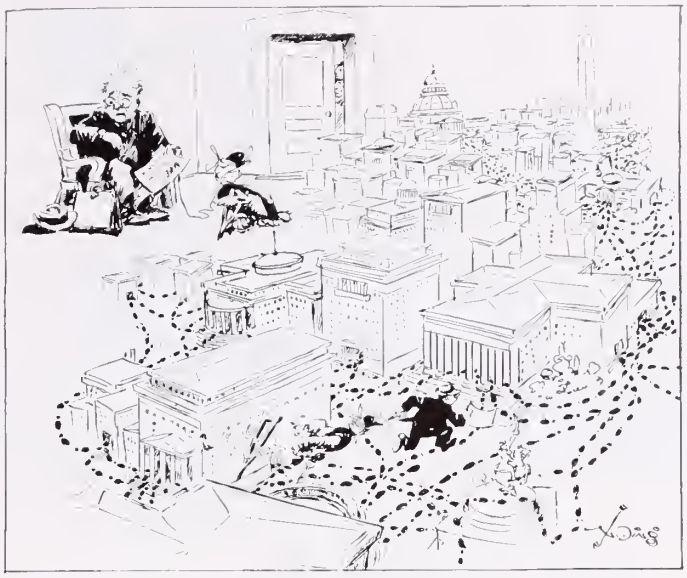
The reshuffle of the personnel in the Bureau of Biological Survey was followed by the relief that comes from extracting a badly ulcerated tooth. The soreness did not last long, and the way the majority of the people in the bureau—like hungry bass—snapped at the lures of constructive work to be done, was an unexpected pleasure. Field men came in to the central headquarters who had not seen a representative from the home office for seven years. Skilled young men and trained technicians with their heads full of the right things to do, but never a chance to demonstrate, blossomed like bright daisies all over the place.

Sure we ran into debt. What did I know about bureaucratic finances; and besides, hadn't F. D. R. promised $1,000,000? The moss-covered accounting division of the Department of Agriculture was unimpressed by the million-dollar promise of the President, and held us rigidly within our budgetary limits.

With the importation of a skilled specialist or two, recruited from outside, and the rejuvenated staff men within the Bureau, our restoration area inspections, corrections and final details moved ahead rapidly. All we needed was a little slice of that million-dollar Presidential promise to start the machinery.

It was at one of the White House Sunday night scrambled egg suppers that Mrs. Roosevelt dropped me a bit of *sotto voce* advice on getting to the President with my stalemated program. "Frank is just a pushover for maps," said she, or words to that effect. "You can get most anything you want if you just show him a good map." I tried it and it proved quite true. His fascination was very evident, particularly where artificial drainage had left farmers stranded on unproductive lands. He liked to philosophize on the practices which had ruined so many farmers. This was always my cue to remind him that since he did not see fit to allocate any of the promised million, why not suggest to Resettlement that they get the stranded farmers off this old duck nesting ground and ask Harry Hopkins to put some of his unemployed workers to plugging up the outlets of the drainage ditches.

"Good idea," said he, and wrote on one of his little memo tablets, which he called "chits," a memo to the administrators of the Resettlement and another to Harry Hopkins to "Help Ding out on such and such a project." No small boy with a new cowboy hat and Texas boots ever felt more like a big shot than I did walking out of the White House with my first memo signed with the familiar "F. D. R." in his own handwriting! Before I got to the end of that series of "chits," however, none of which ever produced any revenue for the program, the delusion of grandeur had worn pretty thin, along with my shoe leather. With little variation, all of the memoes read: "Please find a million dollars for Ding's ducks." Signed F. D. R. These "chits" were never put in an envelope, and I could always read the cheering message and hit the trail of the relief agencies with new hope.



I could always read the message and hit the trail with new hope.

There generally was a long wait in the anteroom, frequently followed by the appearance of the third assistant receptionist and "so-and-so is sorry, but he is very busy today and could you come back tomorrow." When I finally got in for the audience and presentation of the "chit" autographed with the President's familiar initials, there was always a cordial greeting, unctuous expression of sympathy in the great cause I was serving, but right now it just so happened that none of them had a loose million they could let me have. I might just as well have kept the whole lot and never presented them at all, so far as getting any money out of them was concerned, but I never could get over the faith which the President's initials and his million-dollar memoes inspired.

I had moments of suspicion that I was being kidded, but was never convinced until one day Harry Hopkins, no stranger by now, said he had good news for me. He would have the money for me if I would call the next morning at nine o'clock. The next morning at breakfast a newspaper headline caught my eye: "Harry Hopkins sails for Europe." He had sailed at midnight to "study the relief administration as practiced in other countries."

Rex Tugwell, Assistant Secretary of Agriculture, who had always expressed interest in our restoration program, upon learning of my failures to get the necessary funds to implement it, offered to put some of our wildfowl restoration projects on his list of resettlement and sustenance farm projects, which he was to present to the President for authorization and money the next day. Together we went over my project list, selected from it those which fitted pretty well into his pattern of human rehabilitation.

I was anxiously awaiting him on his return from the White House. He did not look very happy and said that the President had spotted our duck restoration projects from the maps I had shown him, remembered their names and locations and said, "That's one of Ding's jobs, isn't it?" and upon confirmation, drew his blue pencil through

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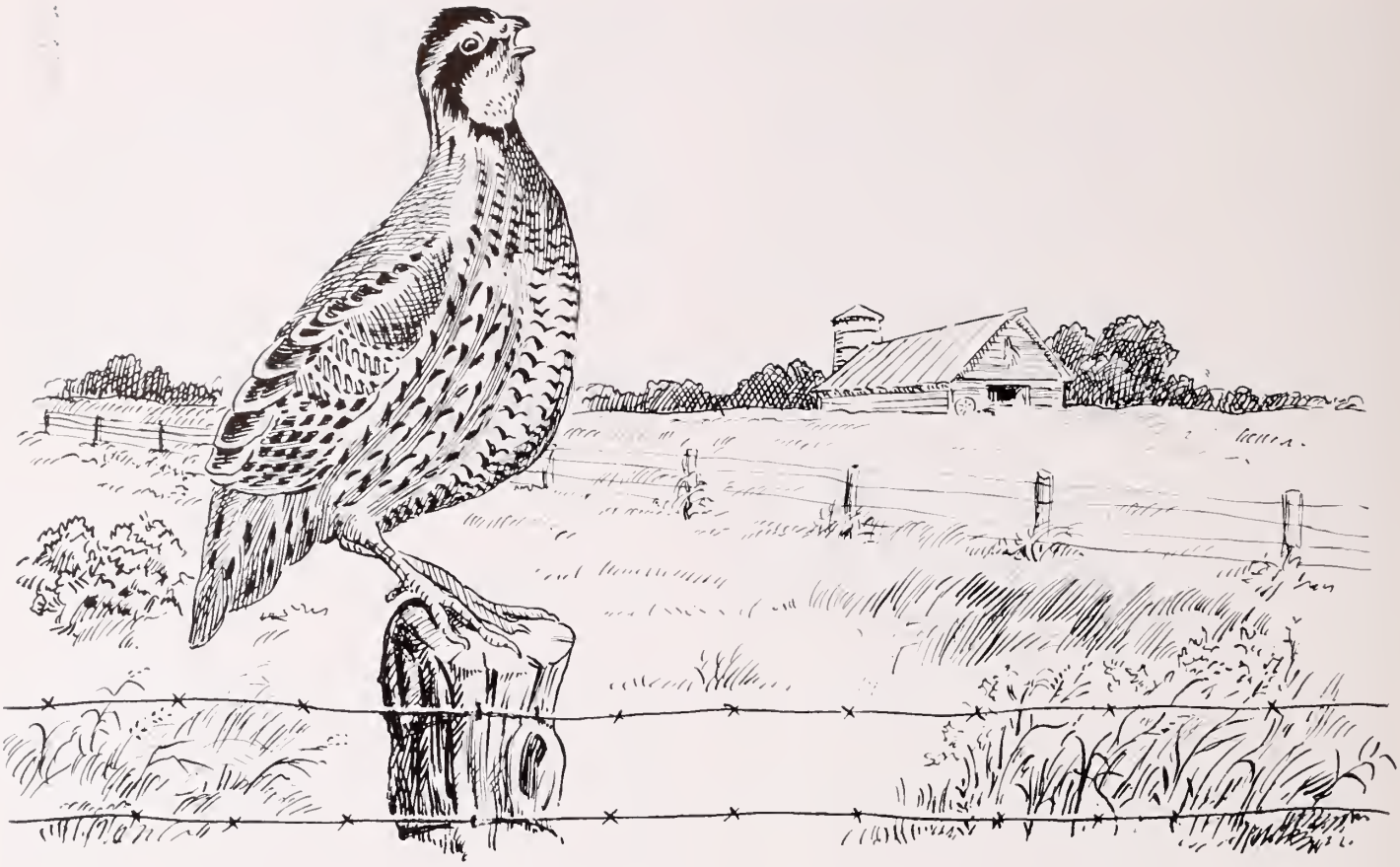


The bobwhite quail is totally beneficial to man.

Virginia's Number One Game Bird:

THE BOBWHITE QUAIL

Statewide, abundant and popular the bobwhite remains the landowner's and the sportsman's best friend

THE whistling bobwhite in the fields needs little introduction to Virginians. Of all game birds, state and nationwide, he is the most popular, most familiar. In the Old Dominion his numbers are put at 3,000,000 with hunters, each year, taking some 750,000 as their rightful share.

Totally beneficial to man over its wide range—its several races cover the eastern, midwestern and southern United States, into Mexico and Central America—the quail is a highly prized dweller of our fields and woodlands.

Contrary to popular belief, the species was not abundant in the days when Indians roamed early Virginia. The white man was responsible for the spread of the quail. During those early days of mule-drawn plows, rail fences and crude methods of farming, the bobwhite increased in the weedy fields and overgrown fencerows.

Today, however, a new era is upon us, "the clean farm." The mule has been replaced by the tractor, the rail fence by barbed wire, and the methods of farming are mechanized. So perfect is their makeup that scarcely a blade of grass is left uncut or a foot of sod unturned. Under such conditions the bobwhite has had a difficult time and its numbers have been reduced.

Various methods of increasing the numbers of quail have been tried. The first quail farm on a large scale was established in Virginia in 1920, but the plan soon proved unsound. Other states followed suit and soon came to the same conclusion.

The belief now is that man cannot out compete nature by artificial quail production. The only sound approach is to have nature raise wild birds by providing the necessities of abundant life. This means proper food and cover and protection every day in the year.

This is the course Virginia has followed in recent years. By cooperating with farmers and landowners and providing technical advice, including seeds and plants, the quail population has become relatively stabilized and hunters may still enjoy following their dogs in the field.

Quail band together for the night and form a compact circle to give themselves better protection from all directions.

The bobwhite lays well to dogs, the covey usually holding tight to the last minute when it bursts forth to gunners in a mighty roar.

The bobwhite is monogamous, and one of nature's most devoted parents. Both parents share the responsibility of the brood, and if one of them meets with misfortune the other takes over full charge of rearing the young.

In Virginia, the breeding season may commence as early as February; northward it starts progressively later. The first "bobwhite" whistle of spring is a sign that the mating season has arrived. An average of 14 eggs is laid per nest and incubation lasts 23 days. The first sign that the brood of 7 to 14 young has hatched is evidenced around the latter part of May or early June.

The chicks develop rapidly and at two weeks of age they begin to flush and fly for a short distance at will. By the time they are two months old they are able to flush with considerable speed and fly rapidly to distant cover. At this age the birds are becoming more independent of manner and their habits are in every way similar to their elders. The young reach maturity at the age of thirteen weeks and, with the exception of juvenile feathers, can hardly be distinguished from their elders.

Just as any other game animal requires plenty of food and cover, so does the bobwhite. However, it is not a slum-dweller. It will not tolerate conditions not to its liking. So, where there is an area with only a few quail, it is a pretty good bet that either the cover or the food is lacking to support more birds.

The bobwhite is now, and will continue to be, one of our most dependable, highly prized, and most cherished wild game possessions. All that it requires, to flourish and continue to provide the highest type of bird shooting to the people of Virginia, is to be given a chance. Quail must have nesting cover, protective cover, feeding cover, open areas and a good source of food, much of which is to be found in or near the herbaceous and shrubby field borders nature sees fit to provide when she is left undisturbed. Under such conditions, the bobwhite will be found, and will be available for the sportsman.

What the Commission Believes:

Virginia's Commission of Game and Inland Fisheries, under the laws of the Commonwealth, is charged with the protection and perpetuation of the wildlife and inland fish resources of the state, and is expected to so manage these resources that they will benefit the widest number of people for the longest time, without danger to the existing supply.

In order to maintain the existing supplies of wildlife and inland fisheries and to improve hunting and fishing in the future, the Commission believes that we must:

(1) Protect our existing supplies of wildlife by adequate law enforcement.
(2) Strive to increase those forms of wildlife that yield to the tools of wildlife management.
(3) Maintain and wherever possible restore habitat for wildlife.
(4) Restock wildlife by artificial propagation or transfer from one area to another only such numbers and species as may be needed for reproductive brood stock or in case of fish such numbers and species as may be needed to furnish brood stock and balance or supply recreational sport where otherwise little would exist.
(5) Support only such restrictions on wildlife harvesting as may be good for the species and sound management.
(6) Conduct only such game and fisheries research as may be practical, economical, and beneficial.
(7) Cooperate with the State Water Control Board in the curbing of existing pollution of our state's inland waters.
(8) Strive for wise and efficient wildlife administration to the end that monies spent from the "Game Protection fund" will give full value received.
(9) Stress conservation education so that our citizens will have better understanding of and the need for the wise use of our natural resources.
(10) Extend cooperation to all land-use agencies, clubs, and individuals to obtain these objectives.

Biologists gathering data at Douthat.

What the Douthat Lake Study Revealed

By ROBERT G. MARTIN
Assistant Chief, Fish Division

"HEY, Dad! What's that man doing out there in the middle of the lake pouring water in that funny-looking sieve?" If the fish had been hungry or father's spirits equal to those of the excited boy on that gray November day in 1951, a little longer stay would have revealed even stranger happenings. For the man in the middle of the lake was a Game Commission biologist taking the first steps of a fisheries investigation that would last for several years.

Douthat Lake, in its mountain setting, is one of the major attractions of popular Douthat State Park located on the Bath-Alleghany county line, northeast of Clifton Forge. Its 60 cool, clear acres, with a maximum depth of 45 feet, were formed by impounding Wilson Creek, a regularly stocked trout stream.

The Douthat investigation, one phase of a statewide impoundment survey, was divided into three related segments: an inventory of fish stocks on hand and an appraisal of the potential fish producing capabilities of the lake; a record of the anglers' catch obtained by employing a creel census clerk; draining the lake and determining the pounds of fish remaining at the end of the fishing season. By comparing the fishes angled with those remaining at drainage, it was possible to show just how much of an inroad fishermen were making in the existing stocks.

INVENTORY

"Pouring water through a sieve" was the boy's eye version of one of the initial steps in the inventory of the fisheries resources of the reservoir. Actually, the biologist was checking for plankton, microscopic food organisms necessary for fish life by straining the lake water through a fine mesh silken net. Laboratory analysis of these samples revealed that the reservoir was poor in this type food. The reason for the low abundance of plankton was found in an examination of the watershed above the lake. Of shale origin, the soil was found to be relatively infertile and deficient in many elements essential to fish food production. Thus, since fish production like the production of land crops is dependent on fertility, it was not surprising that plankton and other food organisms were scarce.

Since it has been proven that thermal and chemical characteristics often influence the extent and distribution of fishes within a reservoir, emphasis was placed upon making such determinations in Douthat Reservoir. Figure 1 presents a typical summer profile of the temperature and oxygen distribution found. It may be seen that temperatures remain relatively constant for the first ten feet, suddenly drop 25 degrees between ten and twenty feet, and level off again with scarcely any change down to the bottom. Corresponding to temperature changes, oxygen values also vary. In the upper ten feet zone, oxygen is extremely abundant. Oxygen is still present, although gradually diminishing, in the middle or transition zone and is completely lacking in all water below twenty feet. Thus, for all practical purposes, fish life is restricted to the upper and transitional zones since fish must have oxygen to exist. The lower, oxygenless zone is almost completely wasted space, and since these chemical and thermal conditions prevail during most of the growing season for fish (June-September) the capacity to support fish life is greatly reduced.

Considering the low fertility, meagre food supply and restricted growing space, it was not surprising that few fish were taken during netting and seining operations. However, these fish appeared in excellent condition and exhibited better than average rates of growth. The proportion of bass and pickerel to pan fishes such as bream and crappie was unusally high. Indications that a large sucker population exisited was the only evidence of serious population unbalance.

CREEL CENSUS

Creel census statistics gathered throughout the three-month fishing season, June 20-October 1, faithfully echoed the complaints of poor fishing voiced by disgruntled anglers. Well over half of the fishing trips were unsuccessful. The average catch per trip was only 1.2 fish (.3

pounds) of any and all species. Only one out of every 19 fishing trips produced a bass. The bass averaged less than one pound. However, the bass per trip figure is perhaps not as disappointing as indicated because many of the anglers interviewed fished exclusively for bream and did not use baits attractive to bass.

Along with the poor fishing, and possibly because of it, fishing pressure was especially light. During the three-month fishing season, it was estimated that only 986 fishing trips were made. This amounted to an average of only 16.6 fishing trips per day on this 60 acre impoundment and would be about the same fishing effort as a man and wife would exert on a two acre farm pond if they fished every day for only three months out of the year.

The total number of fishes angled during the season was only 1200, weighing approximately 280 pounds. About 50 pounds of this total was made up of largemouth bass. This represents a total yield of slightly less than five pounds of fish per acre including approximately .8 pounds of bass per acre.

DRAINING

In view of the poor fishing success prevailing during most of the season, it was little wonder that many of the local fishermen were of the opinion that the lake was "fished out." Since the lake had to be drained at the conclusion of the fishing season to repair a faulty drain, it was possible to determine if the fishermen's diagnosis was correct. In cooperation with the Department of Conservation and Development, the lake was drained in early October. All of the fish were removed from the lake, sorted, weighed, and either confined in holding pens for eventual return to the lake or released in nearby streams.

A total of 2500 pounds or slightly over 40 pounds of fish per acre were recovered from the lake. Bream made up the largest percentage of the total, 42 percent. White suckers, comprising 25 percent, were next in abundance. Largemouth bass, 14 percent; chain pickerel, 10 percent; and black crappie, 9 percent, rounded out the major species covered. In addition, a limited number of rainbow trout, blue-spotted sunfish, madtoms, and bullheads were taken.

When comparing the fishes taken by anglers, 280 pounds, during the fishing season with the fishes recovered at draining, 2500 pounds, it is apparent that the lake was not "fished out." In fact, these figures show that 89 percent of the original population was still swimming in freedom at the conclusion of the fishing season! A comparison of the fishes angled and those recovered at draining is graphically portrayed in Figure 11.

Only 14 percent of the largemouth bass had succumbed to the wide array of lures and baits offered. Many of the remaining bass were adult, including 30 of the "lunker" size weighing over three pounds.

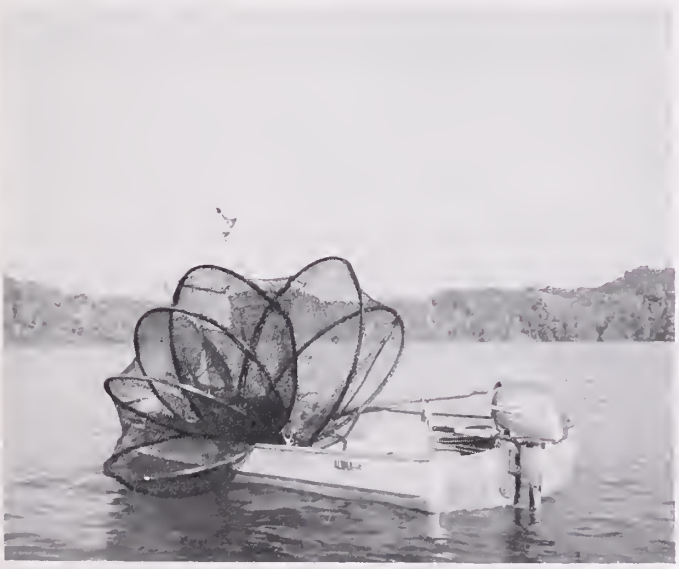
Many local fishermen on hand for the draining were likewise surprised by the large number of crappie remaining. Only seven percent of the crappie had been angled. Bluegill and other pan fishes were likewise inadequately utilized during the season, only 14 percent. The biggest "sucker" from the fisherman's point of view was the chain pickerel, 22 percent of which had been taken. The six hundred pounds of white sucker remaining at drainage belied the name. Only three had been angled during the fishing season.

RECOMMENDATIONS

In view of the poor fishing manifest by creel census data and the limited number of fish found at drainage, it was apparent that corrective measures would have to be taken to appreciably increase fishing success. With this in mind, the following steps were taken:

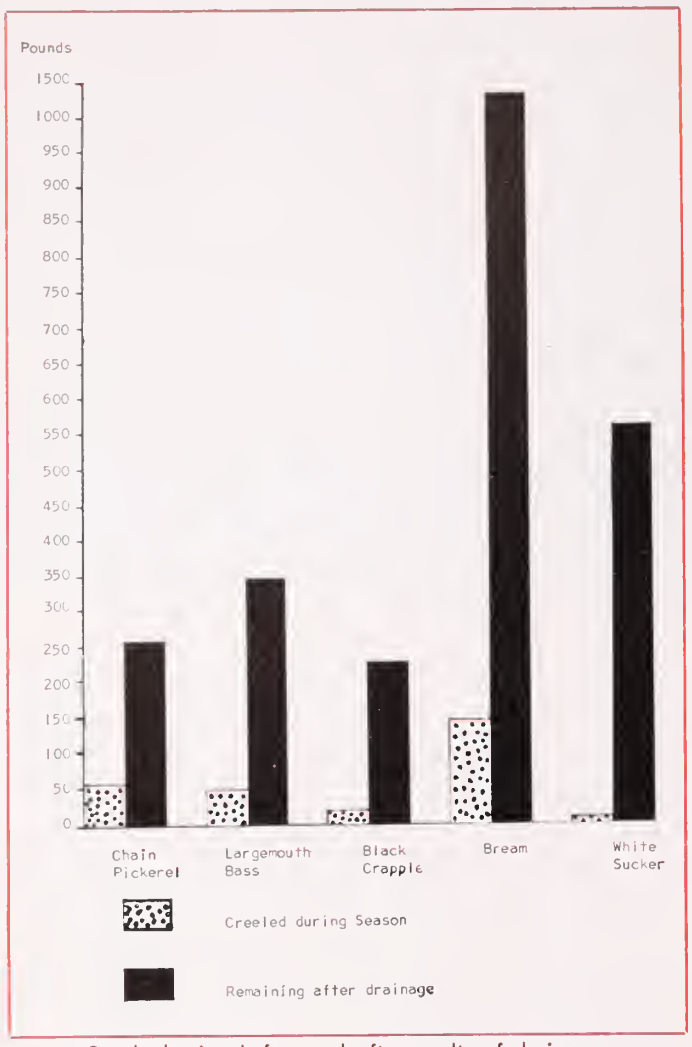
1. Since the sucker contributed nothing to the creel and conceivably depressed the abundance of more desirable forage species, all suckers were removed.

2. In order to increase the growth rates of the remaining pan fishes such as the bluegill, pumpkinseed and crappie, practically all of the smaller size groups of these species were removed.



Fact-finding by fisheries biologists is shedding new light on fish life in our lakes and ponds.

Creel studies and stomach analyses disclose habits and the condition of game fishes. Biologists say more fact-finding is needed.



Graph showing before and after results of drainage.

3. All bass were returned to the lake.

4. To insure a more favorable ratio of bass to chain pickerel, only enough pickerel were returned to insure adequate reproduction.

5. Supplemental stockings of adult largemouth bass will be made in late spring in the hope they will enjoy good survival.

6. Because of the serious readjustment of the fish population following drainage, it was recommended that the lake be closed to fishing until June 20. However, since only 11 percent of the available fishes were being caught by anglers, it was recommended that Douthat Lake be opened to year-'round fishing for all species after June 20, 1954.

REFUGE PROGRAM

(Continued from page 7)

each one of the half dozen of our projects on the Tugwell list, with the remark: "Don't give that fellow anything."

That disillusionment sank in pretty deep, but the real payoff of all of F. D. R.'s little pleasantries had been the memo which he had given me to deliver to Secretary of the Treasury Henry Morgenthau. It was similar to the others: "Dear Henry—Please find a million dollars among some of your funds which Ding can use for the conservation of his ducks." Contrary to the usual procedure, I was ushered into the Secretary's office at once and greeted most cordially, and unnecessarily reminded that he had been conservation commissioner of New York State under Governor Roosevelt—always glad to do anything possible in the way of conservation. Relating briefly my mission, the Secretary looked quite startled. He thought he should call the White House about it, and did. His worried look gave way to a relaxed smile as the President evidently explained the hoax.

Of course he knew, and F. D. R. knew, that the Secretary of the Treasury had no authority to dispense any funds whatsoever except on fixed instructions from Congress. I knew that too, but there were such strange things going on in the field of finance in those days that one could never tell right from wrong, and for the sake of conservation I was willing to take a chance.

A few days later a typewritten letter from the White House enclosed a negative report from the Secretary of the Treasury. He was informed by the legal staff of the Treasury Department that the Secretary of the Treasury was prevented by law from complying with the request for funds with which to finance the Duck Restoration Program. Congress alone had jurisdiction over Treasury expenditures and the Biological Survey director was advised to take his request to Congress and depend on the action of that august body to determine the fate of our emergency duck mission. F. D. R.'s accompanying letter expressed disappointment that all his efforts had proved so fruitless. He now was convinced that our only course was to apply to Congress for special appropriations to finance the Emergency Duck Restoration Program.

It was a copy of that letter which the late Senator Norbeck used to pull from his inside pocket in defense of his six-million-dollar resolution whenever he was accused of "conspiracy to defraud the U. S. Government." God rest his kindly soul for his sense of humor and righteous indignation over what seemed to him—and to most of us who knew the circumstances—an uncalled for affront to an important and practical conservation program. His timely Senate Resolution broke the deadlock. The national wildlife refuges are functioning successfully. The present system has grown to a total of 272 refuge areas, comprising 17,409,968 acres, unique in the world's conservation of wildlife.

Who conceived and established the National Wildlife Refuge Program? It does not matter much because, for those who participated, there remains a monument to their efforts which will stand as long as migratory waterfowl continue to follow the four great flyways of the North American continent.

Already several bills have been introduced in Congress which have sought to open the migratory waterfowl wildlife refuges to public shooting. The grazing herds of the cattlemen's associations would like to invade the restored areas. Mineral rights and wildcat drilling for oil on areas set aside for wildlife conservation, national parks, national monuments and national forests continue to seek special dispensation. The refuge system is now in good hands and being well managed, but the time will never come when it will not require careful watching.

VIRGINIA WILDLIFE

CONSERVATIONGRAM

Commission Activities and Late Wildlife News . . . At A Glance

LAKES BURTON AND CONNER OPEN TO FISHING. On June 16th Lake Burton, near Chatham in Pittsylvania County, and Lake Conner, in the northeastern section of Halifax County, the two most recent ponds constructed by the Commission of Game and Inland Fisheries, were opened to public fishing.

COMMISSION RECEIVES CHECK FOR ANOTHER FISH KILL. The Commission of Game and Inland Fisheries has received a check for $1240. paid to the State Water Control Board by the Mathieson Chemical Corporation as the penalty for unlawfully destroying fish by diverting poisonous materials in the Holston River at Saltville in Washington County. The money will be used in the acquisition of suitable species of fish to replace those killed in the Holston River.

COMMISSION BIOLOGIST TO TAKE CANADIAN WATERFOWL STUDY. The Virginia Commission is lending C. P. Gilchrist, waterfowl and marsh specialist to the United States Fish and Wildlife Service for a few weeks this summer to help make a study of ducks and geese on their nesting grounds in the eastern and northern provinces of Canada. The study will help determie the number of days in the open season and the bag limits on waterfowl generally throughout the eastern United States.

NEW HUNTING REGULATIONS ACCEPTABLE TO PUBLIC. On May 14th the Commission completed the task of formulating regulations for hunting upland game birds and animals dur ing the 1954-55 season and so far there has not been a single note of complaint. It is always the purpose of the Commission, keeping in mind the welfare of the wildlife of the state, to fix seasons and bag limits so that the public can harvest the surplus wildlife supply.

PUBLIC PONDS PROPOSED AND IN PROGRESS. Under its program of constructing or acquiring public fish ponds in suitable needed areas in the state, the Commission of Game and Inland Fisheries is concluding acquisition of two adjacent ponds, totalling 80-acres in Powhatan County. The Commission has let the contract for construction of a public fish pond in Fauquier County to Higgerson Brothers of Hickory, Virginia, low bidder at $40,103. The Commission will soon be inviting bids for the construction of one and probably two more fishing ponds in the Piedmont section of the state.

YEAR-'ROUND BASS FISHING PRAISED. Holman Willis, Jr., member of the Commission of Game and Inland Fisheries, reports that Carvins Cove near Roanoke has been among the most satisfactory fishing bodies of water in the state since the Commission declared a year-'round open season on bass in all public impoundments of the state. During the spring of 1954, bass weighing five to nine pounds have been caught out of Carvins Cove almost daily.

COMMISSION RECOMMENDS CROW SHOOTING. While hunters are required to have a proper hunting license to shoot crows, generally they are passing up one of the finest sports in Virginia. Crows do considerable damage to sprouting corn and other grain just breaking through the crust of earth. Farmers generally are very happy to give permission to hunters to shoot crows because of the damage they do to planted crops. The Game Commission recommends that all hunters avail themselves of the opportunity to cooperate with farmers and landowners in reducing the crow population.

COMMISSION INAUGURATES TV PROGRAM. A regular monthly TV program over WMBG, Richmond, has just been put into effect as an educational feature of the Commission, Executive Director I. T. Quinn, has just announced. The program comes on at 5:50 P.M. the first Monday of each month and features a varied program: outdoor news, panel discussions, interviews and demonstrations. J. J. Shomon is in charge of the program.

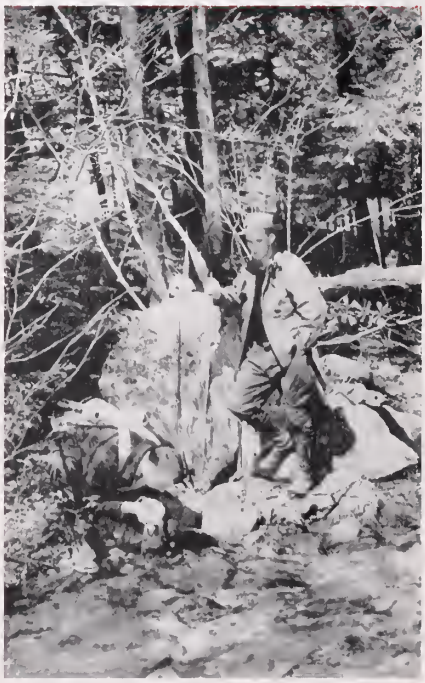
SCENERY. Rugged mountain panorama is evident from many vistas and overlook

Recreation Unlimited

VIRGINIA'S TWO NATIONAL FORESTS, the Washington and Jefferson, afford unlimited, wholesome recreation to pleasure seeking outdoors folk. Second in importance only to water, recreation is an ever-increasing use of the 1,500,000 acres of public domain in Virginia.

(Commission staff photos)

SOLITUDE. The quiet fastness of the mountains draws out the artistic spirit.



HIKING. Hundreds of marked trails weave through the forests.

RIDING. For those who l network of good

CAMPING. Camps may be pitched anywhere on the national forests. Campfire permits are required however for all areas except developed camp sites.

WILDLIFE. Cooperative Commission—U. S. F. S. program is bringing back the wild turkey. Deer and grouse are abundant.

PICNICKING. Summer picnicking is an extensive use of the forest areas. Hundreds of picturesque sites are open.

DRIVES. Motorists find that dozens of roadways offer scenic views of the rugged Alleghenies.

y riding or back-packing, a oads is available.

CANOEING. Relatively unusued are many suitable canoeing streams.

FISHING. Trout and smallmouth bass waters are extensive, picturesque. Commission stocks many streams.

HOW TO "DROWNPROOF" YOURSELF

By PROFESSOR FRED R. LANOUE
Georgia Institute of Technology

Editor's note: *This article has been distributed by the Water Safety Congress in the hope it will help reduce the loss of lives by drowning.*

DROWNING ranks second only to traffic deaths as a single cause of accidental deaths, yet a technique developed at Georgia Tech has proven that nearly anyone can easily be "drownproofed" for extended periods of time, certainly long enough to be rescued under ordinary circumstances.

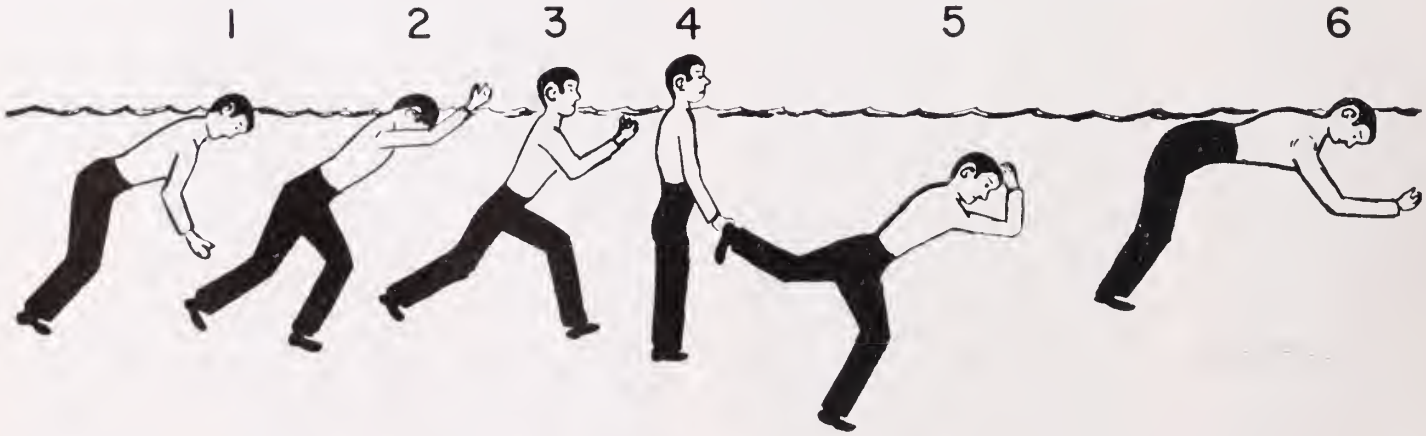
To give an idea of the effectiveness of the Georgia Tech method, an interesting experiment was conducted at Tech with sixty POOR swimmers. A third of this group had their wrists tied behind their back, another third had their legs tied in a half bent position, and the remaining third were free. Average quitting time of these POOR swimmers was four hours and forty minutes, and sixteen of them reached the objective of EIGHT HOURS. It seems as though these folks approach "drownproofing."

"Drownproofing" is fundamentally the development of a technique of breathing while swimming in deep water with such an absolute minimum of energy expenditure that terrifying complications like multiple cramps, heavy clothes, disabling injuries, high waves, rough water, and long immersion have little or no effect on survival. Many of our NON-SWIMMERS who have never swum one length of our pool, have stayed up *one hour* in the crowded deep end of our pool, using this technique, which most of them learned in about a dozen lessons. As a beginner, would you rather have a pretty stroke, or still be on the top an hour after an accident in the water.

Hunters, fishermen, boaters, swimmers, picnickers—anyone who uses the water for recreation or work—owe it to themselves, AND THEIR FAMILIES, to learn how to protect themselves in the water. This technique is cheaper and better than any insurance or gadget you can buy, and it is quite easily self taught with a little practice.

The new technique has its basis in physics. Specific gravity of the average human body is about .97, thus, only about five pounds of most individuals will float out of water even with the lungs full of air. Unfortunately, as the head weighs more than five pounds, unless strength is constantly expanded, in the normal swimming head position, the breathing sources, unlike most animals, are located underwater. The problem of people in a potential drowning situation, then, is one of getting enough air to buoy one up, yet to do so in a manner to avoid tiring. This is best accomplished by using the Tech procedure as shown in the accompanying drawing.

Advantages of the Tech procedure are many. First, air provides all buoyancy needed, after putting the face back in the water, thus eliminating many tiring, unnecessary movements. Second, the possibility of choking is minimized by not tipping the head back. Third, real relaxation and long rest periods are obtained by proper spacing of the arm and leg movements. Fourth, the method works nearly as well with arms or legs alone, or using only one of each—folks DO get cramps, disabling injuries etc. while swimming.



1. With lungs full, float face down with back of the neck on the surface.
2. Get ready for a downward thrust using arms, legs, or both. Be sure mouth is empty.
3. Exhale through nose *WHILE* raising head so that mouth is in the air, shoulders under.
4. With head vertical, thrust downward for support during mouth inhale.
5. With lungs full, drop head forward, immediately thrust *downward and backward.*
6. Relax, with head, arms, and legs dangling, holding all air, while floating forward and upward. Learners rest three seconds here, experts rest ten seconds.

These underwater photos show a Georgia Tech swimmer in positions 4 (left) and 5 as described in the accompanying drawing.

One of the principal reasons for drownings is panic. Panic causes poor swimmers to flail about and waste energy until they sink. It causes them to try to swim too fast, then tire and sink. Distance without speed means literally nothing to a TRAINED swimmer. As long as the swimmer stays underwater, more than out of water, there is practically no strain. The best swimmers at Georgia Tech and at Emory University cannot hold fifteen pound weights out of water using legs alone for more than three minutes, although they can easily stay up for hours and swim miles, with their hands tied behind their backs. How silly it is for poor swimmers, or any swimmers, to try to hold a fifteen pound head out of water for any time. The Georgia Tech procedure makes air do all the work of flotation. minimizes choking, and really produces relaxation. It works equally well on hes or shes—old or young—fat or skinny—tall or short, and, smart or dumb.

Of the present 4000 Georgia Tech students who have taken the required course in swimming, with the technique as the foundation:—

3800 have swum a mile unclad

3600 have swum a mile wearing pants and long sleeved shirts

3200 have treaded water 45 minutes with wrists tied behind backs

2500 have recovered a body from an eleven ft. depth and towed him 60 yds.

Not a single one has failed to learn to swim before graduation.

Practically identical figures were obtained at Emory University, which has cooperated enthusiastically in the development of this technique.

This article is not intended to influence people away from using life jackets, boat cushions etc., or from exercising extreme caution while on the water. There will always be people who have to be cared for. This article is aimed at the people who do the caring. We want to change fear of the water to respect for the water, and we want to remind you that in deep water, a technique in the head is worth a million helping hands—that may be out of reach.

Some Don'ts for Anglers and Non-Swimmers

A word to the wise should be sufficient. Water can be dangerous. as attested by hundreds of Americans who drown needlessly each year. If you go fishing, boating, swimming, then exercise every caution and be careful. The following 8 rules will help you keep out of trouble:

1. Don't go out in a boat without a life preserver if you can't swim; and, don't go into water above head if you can't swim.
2. Don't go in or near water if you intend to use intoxicants.
3. Don't go out in a boat in rough weather. Come in early at the first sign of a storm. Better to lose a fish, than a life.
4. Don't overload a boat.
5. Don't misbehave in a boat. If you must stand or change positions, be extremely careful.
6. Don't be a speed demon. Speed invites accdients.
7. Don't cast sideways. Use overhead method.
8. Don't be a reckless navigator. Observe signs and water rules.

The Cottontail Rabbit in Virginia

By JAMES E. THORNTON
Assistant Chief, Game Division

National Audubon Society photo by John H. Gerard

The cottontail is Virginia's most prolific game animal. With better management the rabbit population can be greatly increased.

WITH the possible exception of the gray squirrel, the cottontail is the most important game animal in Virginia. To the so-called "one-gallus" hunter, it is *the* game animal of the state, and its ability to live and flourish in close proximity to civilization makes it the chief target for boys as well as adults.

No one knows how many rabbits are killed by Old Dominion hunters each year, but an indication of the total bagged is the fact that 30 percent of all the shotgun shells used each year are intended for the cottontail.

The interest in this furry game animal has mushroomed and it has become important to the field trial folks as well as to hunters. The number of field trials has increased tremendously and this pursuit in itself is becoming a major sportsmen's activity. That the beagle hound has become the most popular dog in the United States, speaks well of his majesty, the cottontail.

RACES OR FORMS

In spite of the elusive character of the cottontail, it is so common that it needs no description. In "scientific circles," it is known as *Sylvilagus floridanus*, and there are at least five distinct races in Virginia. Most important is the eastern cottontail (*Sylvilagus floridanus mallurus*), found throughout most of Virginia. Others are Mearn's cottontail (*Sylvilagus floridanus mearnsii*) which occurs principally in the extreme western part of the state; the Hitchen's cottontail (*Sylvilagus floridanus hitchensii*), found only on several islands off the Atlantic coast; the New England cottontail (*Sylvilagus floridanus transitionalis*), which lives generally in the higher Alleghany and Blue Ridge mountains; and the North Carolina marsh rabbit (*Sylvilagus floridanus palustris*), found in the low-lands of a few southeastern tidewater counties. But "rabbit" to most of us in Virginia is the "cottontail."

HABITAT

The cottontail thrives on nearly all farms where there is some type of brushy cover and such seasonal foods as grasses, clover, grain and native green plants during the spring and summer, bark of srubs, fruit tree limbs, grain, in the fall and winter. These congenial conditions are found along brushy fencerows, woods edge, ditch banks and the edge of marshes.

Cottontails seldom move more than a mile from their birthplace, though there is a certain amount of seasonal shifting, concentration in small areas in winter because of food shortage and scattering in spring and summer when food and cover are abundant.

It is often said that it is easier to list the plants the cottontail will not eat than the wide range of native plants, vegetables and crops it will eat. It does have preferences, though, and they include succulent clover and grasses, grain and fresh apple limbs rather than greenbriar shoots, sassafras or dry bark. But when winter snows cover the green grass and other low growing vegetation, it takes what it can get which usually is the bark and buds of green shoots which stick up from the snow.

LIFE HISTORY

Young rabbits are born from March through September, with the principal breeding season in Virginia in March and April. The young are born naked and helpless, with eyes and ears tightly sealed. The nest, constructed by the female a few days before it is to be used, consists of a cup-shaped excavation at the edge of a grassy field or meadow. It is lined with dried grass, with an inner lining of fur from the underside of the mother rabbit. The top is plugged with similar material to protect the young and help camouflage the nest. Gestation lasts 30 days and three or four litters are produced each season, with an average of four per litter. The young remain in the nest for at least two weeks.

DISEASE AND PREDATORS

Any animal with the reproductive "potential" of the cottontail must have a high mortality in the wild or it would soon overrun the country. This almost happened in Australia where it has few natural enemies. Besides hunters, who actually take a comparatively small percent of the rabbit population, here it probably has more natural enemies than any other game animal or bird and

is considered a "forage" species for many carnivorous animals, such as the fox, great horned owl, weasel, mink, marsh hawk, red-tailed hawk and stray house cats.

However, the predators account for relatively few of the total population taken. Many nests are destroyed by spring plowing and discing. Spring floods, prolonged drought and fire account for large numbers. Harvesting operations, mowing, etc., take their toll. Cats and dogs are particularly dangerous to young rabbits. Mortality caused by highway accidents is terrific.

Diseases and parasites, while normally not a major cause of death in the cottontail, are always present in the wild and may break out in epidemics at periodic intervals. Tularemia at times kills large numbers of rabbits as well as other small animals. The danger to hunters can be lessened by avoiding "sick-looking" or "sick-acting" rabbits. Use of rubber gloves while dressing rabbits and thorough cooking also reduce chances of catching the disease.

External and internal parasites on the cottontail are nearly always present, but under normal conditions seldom cause the death of the animal. Ticks, lice and fleas, however, when present in large numbers, may cause death, particularly in young animals. Rabbit bot or warbles are probably most familiar to the rabbit hunter, especially early in the hunting season when the weather is still warm. There is no evidence to indicate that this parasite causes any serious damage to the rabbit population or to the value of the rabbit as a hunting trophy.

In spite of all the factors working against the cottontail, it has somehow managed to keep going. "Gobbled up by a host of predators, subjected to serious diseases, flooded and smothered and starved, smashed on the highways and mangled in traps, the wonder may be to many that any cottontail survives."

The proper amount of food and cover is essential to the cottontail, as it is to all wildlife species. Ladino clover has been found to be an excellent rabbit food.

But all these things are nothing compared to the destruction of the animal's home. Without a place to live and grow and reproduce it is doomed. Fortunately, for Virginia hunters and for the rabbit, its living requirements are not exacting and all it needs to get along is very little effort on the part of the landowner. This is where "Cottontail Management" comes in. This destruction of native habitat is responsible for decrease in the cottontail as well as for the decrease of most of our wildlife species. The task of management is to prevent further destruction of its habitat and to restore habitat conducive to its abundance.

MANAGEMENT

In order for the cottontail to produce a maximum "crop" for the hunter, an abundance of food and cover is essential: food enough to keep healthy all during the year and cover enough to escape the multitude of its enemies which are forever trying to include it as a part of their food supply, to keep warm in winter and cool in summer.

Food is not normally a big problem for the bunny. His big problem is to keep from becoming some other creature's food, which requires cover, a place to get away from it all. On most farms enough food and cover can be incorporated into the farm plan to produce a huntable surplus of rabbits.

Specifically, what can be done to have rabbits in abundance? Generally "adoption of sound land management practices which are favorable to wildlife will produce more game than all the specific measures that sportsmen and wildlife men can persuade the landowner to employ." Unless the agricultural practices carried on by the individual landowners are conducive to wildlife production, the small specific improvements in wildlife habitat which the landowner or sportsman is able to do will accomplish very little. Nearly all farms have some waste acres that are usable to produce food and cover for the cottontail and other game species.

Nesting cover consists of open grassy fields which should be near good brushy escape cover. Unmowed hay fields, broom sedge fields and even pasture fields that have not been grazed too close make good nesting sites. Ditch banks with a good grassy sod and other cover nearby will also pass. Brushy fencerows, briar patches, honeysuckle thickets offer good escape cover possibilities. Brush piles, rock piles, honeysuckle rows are good examples of shelter cover. Often the same location provides all three types of cover, but to be most effective, a good food supply should be within easy reach.

What are some of the things that a farmer or landowner can do to provide these necessities for the cottontail? There are a number of simple practices which require little or no extra effort, such as mowing or combining grain fields so that the stubble is higher than normal to provide essential ground cover for young rabbits as well as adults. By leaving a swath of grain or hay around the edge of the field during harvesting, additional food

and cover is provided. The plowing of stubble fields and weed fields should be deferred until as late as possible in the spring. Where corn is harvested with a mechanical picker, leaving the stalks in the fields until spring provides extra cover during the winter months. Also, sowing a small amount of clover, rape, turnip salad, or other green crops in these same corn fields will provide food to go with the cover.

To provide cover, the growth of a reasonable amount of weeds, shrubs and briars along fencerows, ditch banks and in odd corners is desirable. Encouraging or planting blackberry, wild plums, wild roses, etc., in unused corners helps provide needed shelter and escape cover. The planting of multiflora rose fences offers excellent possibilities along this line which has not been explored fully here in Virginia.

Another project that sportsmen might undertake is the construction of artificial dens through the use of drain tiles, hollow logs, metal drums, pipe, etc. Such objects should be covered with rocks, heavy sod, or brush.

After heavy frost, most of the herbaceous cover is laid low and whatever is left becomes conspicuous to hunter and predator. Then the brush pile comes into its own. It has been said that good cottontail management in Virginia is as simple as building plenty of good brush piles in the right places. They should be placed in or near durable escape cover such as briar patches, broom sedge fields, honeysuckle thickets, etc. The brush should be piled closely on top of long logs or large rocks to provide head room for the bunny to move about. They should be plenty big, too, four or five feet high and 12 or 15 feet across to provide maximum shelter after settling. Brush from recent lumbering or logging operations, pruned from fruit trees or shrubs, are suggested sources.

Windrows from bulldozer operations provide excellent cover, with orchard grass, ladino clover, sericea lespedeza or other green cover crops for food planted nearby.

Though coniferous trees or shrubs do not provide any significant amount of food, they do offer excellent shelter and clumps of cedar, pine or other evergreens are often headquarters for a number of cottontails. The planting of such cover is a worthwhile project for anyone interested in the welfare of the rabbit. Discarded Christmas trees may serve the same purpose.

The promiscuous grazing of livestock probably has destroyed more cover for farm game in recent years than any other single thing. Fencing woodlots and waste areas, rock outcrops and other areas of low pasture value would go a long way towards providing for the needs of all farm game.

In these days when power lines, gas lines and telephone line rights-of-way criss-cross the countryside, the resultant open areas offer excellent opportunities for wildlife habitat improvement, by planting such areas to ladino clover, fescue or orchard grass, sericea lespedeza or other plants or crops providing food or cover.

The planting of annual food patches and field borders of shrub lespedeza and sericea lespedeza will provide food of high quality as well as some cover to benefit all types of game birds and animals. Planting small patches of leguminous plants such as ladino clover or grasses, such as orchard grass or fescue grass, to provide winter greens is particularly valuable to the cottontail.

Fortunately the requirements of the cottontail are not very exacting, compared to other farm game birds or animals. With a reasonable amount of food and cover, the cottontail will pull through many a crisis. One thing sure, if Virginia hunters have their way, Molly Cottontail will be with us for a long time to come, and as sure as the frost is on the briar patch on a crisp November morning, the cry of beagles in hot pursuit will be heard across the Virginia countryside.

The Heartbeat of Conservation

Conservation is essentially the struggle between good and evil. That may be oversimplified, but where is it more evident than upon the land?

When land—the Mother Lode—is abused, decadence and deterioration lead inflexibly to final chaos. As goes the land, so goes our spiritual and material wealth.

Aldo Leopold penned a truism that should be in the hearts of all our people: "Conservation is a state of harmony between man and land."

When deer populations rise to the danger point there is only one practical management solution: the herd must be cut down by taking both male and female deer.

Commission Relaxes Deer Season

Ten Western Counties Get Antlerless Regulation

MORE lenient regulations concerning the hunting of deer in ten counties west of the Blue Ridge Mountains have been adopted by the Commission of Game and Inland Fisheries.

It has been decided that antlerless deer will be legal game on the last day of the season in the counties of Frederick, Highland, Warren, Page, Shenandoah, Rockingham, Augusta and Bath. It was decided also that antlerless deer (either sex) may be taken from the Glades Area in Wise and Scott counties during the deer season on a permit basis.

Studies conducted by the Commission technical personnel over the past few years have revealed the following:

In the ten counties named above the deer herds have now occupied most of the suitable range and have reached a level where greater harvesting is both possible and needed.

Several areas in Bath and Shenandoah counties in particular show the effects of overbrowsing by deer herds. Evidence on the ground is supported by the below-par weights and inferior antler development of the deer coming from these areas. To keep the deer in a healthy condition, the biologists say, it is necessary that their numbers be kept in balance with the food supply. The only way this can be done is by removing some of the doe deer.

Crop damage has also reached the point where control is necessary. Orchards, field crops, garden and alfalfa bear the brunt of this damage by deer. This damage will be better controlled by the increased harvesting of deer in agricultural areas.

The Commission believes that many of the herds have reached the capacity of their ranges, and that now more deer can be safely harvested each year. About twice as many deer can be taken under the proposed regulations than under a buck "only" law. This is not only good news for the hunter but also means the herds can be controlled which in turn will sustain available foods and reduce crop damage. It will mean better deer in the years to come. It will mean more successful hunters and the realization of the objectives of good deer management: full use of the resource for the benefit of the public's interest without danger to the future supply.

A final word should be mentioned about the Commission's action in passing this regulation. Many hunters may have some anxiety about the deer herds, especially the taking of does, since they recall the shortage of deer before the restoration program was put into effect.

To those who may be concerned, it may be said that the Commission is conservation-minded and certainly has no desire to see the deer herds endangered. If anything, the Commission's interest is in seeing that the deer are kept healthy and in good all-around shape.

This means that food and cover must be kept in balance with deer numbers. In the area in question, there is only so much food. In an aging forest, the browse provides only so much food. When deer increase at a rate of 20 per cent a year, as they have done in this section, then the herds must be kept in balance..

The removal of buck deer *only* will not hold the deer down to a given level. Both sexes must be taken.

THE HOLY EARTH

THOU SHALT INHERIT *the holy earth as a faithful steward, conserving its resources and productivity from generation to generation to generation. Thou shalt protect thy fields from soil erosion and thy hills from overgrazing by thy herds, so that thy descendants may have abundance forever. If any shall fail in this stewardship of the land, his fertile fields shall become sterile stones and gullies, and his descendants shall decrease and live in poverty or vanish from the face of the earth.*

—WALTER C. LOWDERMILK

Photo by Dr. A. A. Allen

A rare photo of a pair of ivory-billed woodpeckers at their nest near Tallulah, Louisiana.

Ivory-bill Now Believed Extinct

By W. C. KELLNER
Special Services Officer

PROBABLY FEW naturalists, now living, have seen a live ivory-billed woodpecker. This magnificent bird, even in its undisturbed habitat, was perhaps never a common bird.

The ivory-bill and our pileated woodpecker are very similar in structure. The ivory-bill averaged being 20 inches long with a wing span of 30 to 33 inches. It was a blue black with greenish below, and a white stripe ran down the neck and shoulders. There was a conspicuous white area on the wings. The male had a long red and black crest, while the crest in the female was solid black. Both male and female had a 2½ to 2¾ inch long straight ivory colored bill. Our pileated is not as large, averaging 18 inches in length; however, the markings are similar. The neck is more slim and both male and female have a solid red crest with a black bill.

Dr. James Tanner, of Cornell University, made an extensive 3-year study of the life of the ivory-bill. He spent many months in the swampy virgin forest of our Southeastern states, the last domain of this giant woodpecker, and found that each pair required a minimum of six square miles of primitive wilderness in which to live. He calculated that an average of 36 pairs of pileated woodpeckers, our largest Virginia woodpecker, could subsist in the same piece of woodland.

The ivory-bill's food consisted almost entirely of the grub of borers that attacked a tree soon after it died. These grubs tunneled just beneath the bark of such trees as sweet gum, Nuttall's oak, and ash. As decay ate deeper into the heart wood, this woodpecker was no longer interested and left the remaining grubs to the less finicky pileated.

Over a long period of time natural extinction no doubt takes place in some species of birds as well as other forms of plant and animal life. This undoubtedly played a part in the passing of the ivory-bill. The bird known for its low vigor and restricted environmental requirements was headed for natural extinction; however, man and the pressure of civilization sped it on its way. Tanner noted that the disappearance of the ivory-bill in the different sections of the southeast coincided with the timber cutting.

A large showy bird like the ivory-bill naturally would be the target of man. From the time of the Indian (it is known that they prized its scalp and bill for ornamental purposes) to the pseudo naturalist of its last day (who shot it to examine it closely) the bird was harassed by man wherever he found it.

One lone ivory-bill was seen in the Singer Tract of Louisiana, one of its last strongholds, as late as December of 1946. Since that time not one has been reported. Now the ivory-bill has the distinction, if that be an honor, of being our most recently extinct bird.

Fourteen species or subspecies of American birds are known to have become extinct since the arrival of the white man, Dr. Leonard W. Wing, in his recent book *Practices of Wildlife Conservation,* listed some 30 species of animals that are on the rare and threatened list.

In recent years there has been a widespread interest in our rare threatened birds and animals. Many local and national conservation organizations are spending energy and money in behalf of these dwindling wildlife resources. Some species will undoubtedly respond to wise management, which must include rigid protection and a vigorous education program. The increase of the one-time critical wood duck population is an example of what can be done.

Those actively engaged in conservation work should aid in every way possible to see that the whooping crane, the California condor, and others do not follow the ivory-billed woodpecker on the already too long list of birds that are extinct in North America.

An up-to-date article on extinct wildlife and the status of disappearing animal life will appear in the next issue.

Camping Under Virginia Skies

By JAMES PLESS
Immediate Past-President,
Virginia Camping Association

Camps is a wholesome pastime that can be enjoyed by all people. Youngsters particularly find living outdoors enjoyable.

VIRGINIA is fast becoming famous as a "camper's paradise." From the peak of Mount Rogers, Virginia's highest mountain, to the sandy seashore, are found some of America's finest camping sites.

The boys and girls of our state have the opportunity of camping in a wonderland of scenic beauty and of learning the ways of nature at first hand. From Camp Virginia at Goshen Pass with its backdrop of mountain grandeur to Camp Owissa on the Chesapeake Bay—from Rock Enon near Winchester to Danville's Camp Stony Hill—is an unceasing panorama of beautiful camps.

Let's take a sneak preview of the ever-moving picture of pleasures to be found under Virginia skies.

Here's one shot of boys and girls, and others still young in heart too, recapturing the spirit of their pioneer ancestors as they gallop on ponies on an overnight trip to a peak high in the Blue Ridge chain. The scene changes to a rushing river where a group of exciting boys chortle with glee as their canoes, loaded with gear, wend their way up the rocky and picturesque Cow Pasture River. The camera shifts to a group of girls, transformed into 20th century Robin Hoods, as they glide with bows and arrows through a meadow nestled snugly between two hills. Another group of tanned and ruddy boys scream with delight as they race energetically with a two-man saw at a wood craft camp.

In other scenes, a sailboat bucks the dashing waves on a mile-long fresh water lake; boys line up for rifle practice against a Civil War Bunker; and a group of Girl Scouts take a shell-hike along the shores of the quiet Chesapeake at sundown.

Look at that freckled-face tyke of seven or so with an honest-to-goodness largemouth bass on his line. Have you ever before seen such an expression of contented weariness as lights the faces of that sun-tanned crew just coming ashore. They have been fighting the tide all the way up the James River after a visit to Jamestown and Williamsburg. The trip was doubly adventurous to them because they pictured Captain John Smith as he made the same trip back in 1620. What a marvelous way to learn history by having it engraved indelibly on the mind by reliving the events!

Virginia campers are fortunate in being able to visit time and time again those places rich in history as they take short hikes through Virginia's woods and canoe trips on her inland waters.

These boys and girls are lucky in many, many ways. In addition to the strong firm bodies developed by days and nights under the sun and stars, the campers are learning the what and why of conservation in a way that will stick with them through the years.

Fortunately, our Virginia children do not have to beg Mom and Dad to take them to the zoo to see the wild animals. These children can quietly watch the beaver at work or stand mutely by as a shy fawn drinks from a cool stream.

Wherever you look—a lake in the Piedmont, the mountains or the seashore, a river bank—you will see children camping in Virginia.

These camps teach our children so many things—how to have clean and wholesome fun, how to learn directly from nature, how to live and work together, how to develop useful skills, and how to preserve the wonderful heritage which nature has given them. Whether swimming or molding a pot from clay, watching a bird or collecting sea shells, campers are storing up knowledge for tomorrow.

Around the campfire, each in his own way gives thanks to God for the joy of the little things in life and for the opportunity to use every American child's birthright.

Parents can rest easy when their children are camping. Most of the Virginia camps are members of the Virginia Section of the American Camping Association. The directors of these camps uphold the highest standards of health, sanitation, safety, leadership and guidance programs.

Give your child the opportunity of finding the joys of camping under Virginia skies. Consult the camp directory available at your Community Council office, the State Chamber of Commerce, or the Commission of Game.

Another Deer Killed by Dogs

We have received from Game Warden S. H. Mitchell of Hampton this photograph of a deer apparently killed by dogs.

"The deer," writes Warden Mitchell, "was found by a small boy on Otley Road. This particular street is not built up, but the surrounding neighborhood is a thickly settled residential area . . . The deer's body was found 200 yards north of Kecoughtan Road. When found, the hide, with the exception of a small region, was intact. I could find no sign where the deer had been shot, but a complete

Hampton City game warden S. H. Mitchell beside deer killed by dogs.

fracture of the bone in the upper left hind leg, as you can see in the picture. Also, a fracture of the right hind leg just above the foot."

Bland FFA Chapter Celebrates National Wildlife Week

The 19 members of the Bland Chapter, Future Farmers of America, observed National Wildlife Conservation Week, from March 21-27 as part of their attempt to conserve and increase wildlife.

As group projects, the members set out seedlings on property belonging to local landowners, set out bicolor lespedeza plants on both private property and land leased by the chapter, and gave a program for the high school students on wildlife activities in the state. Pocketbook size calendars stressing the importance of conserving wildlife were also distributed throughout the community.

Individual members set out on their home farms during the week 10,000 bicolor lespedeza plants and 2000 tree seedlings. The tree seedlings will conserve water and also offer cover for game. The bicolor plants will offer both food and cover for game.

In addition to the work of both groups and individual projects, seedlings and bicolor plants were secured and given to seven landowners.

The county game warden, Mr. Ben L. Bird, attended a chapter meeting and answered questions in connection with his work and movies on wildlife to the group. Mr. Bird was also a guest of the club at its annual father-son banquet.

All landowners should be interested in wildlife conservation and the members of the Bland FFA are striving to get farmers in particular to become conscious of the need for their help.

Freak 45-Point Buck from James City County

Harris-Flippen Company, Richmond sporting goods firm, has brought to our attention a most unusual

An unusual malformation. This Virginia deer taken by R. H. Jones of Williamsburg sported more than 50 odd-shaped points.

trophy which came in for mounting, the head of a buck with 45 points, figuring down to ¾ inch, with 30 points on one side and 15 on the other.

Mr. H. R. Jones, a commercial fisherman of James City County, killed the freak buck in a field near his home with a high-powered Savage rifle at a distance of about 300 yards. It weighed 242 pounds.

Mr. Jones says that he had about 15 acres of open land which "we always plant down to green stuff in the fall" to feed wildlife. This particular field was planted to rye and clover.

120-Pound Sturgeon Caught in James

Surry County Game Warden Charles N. Hunter has sent in an unusual incident report of a 120-pound buck

G. D. Lewis with 120 lb. sturgeon caught in the James River near Claremont.

sturgeon caught in a drift net on the James River by Mr. G. D. Lewis of Claremont, Virginia. Mr. Lewis was using the five-pound nylon net with five-inch mesh fishing for shad. He had to halter the fish and tow it to shore.

"Few sturgeon," says Warden Hunter "have been caught in this area in a number of years. It is unusual to catch sturgeons in drifts, especially a buck of this size."

NACEP Convention in California

The annual spring meeting of the National Association of Conservation Education and Publicity was held at Asilomar, California, May 9-12, with 70 delegates in attendance, representing 49 conservation agencies in 24 different states.

Highlight of the program was the evaluation of state conservation magazines by such experts as Seth Gordon, California Director of Fish and Game, Proctor Mellquist, editor of *Sunset Magazine*, and others heading up the panel.

The matter of the use of TV for education and information programs was discussed in a panel with several TV specialists from San Francisco leading and putting on a demonstration of equipment and techniques.

The problem of conservation education in the schools was discussed by several experts representing the California Department of Education.

A complete report on the Convention is being prepared and will be widely circulated as soon as published.

The name of the group was changed to the American Association for Conservation Information and the new officers elected were: Leo Lutringer, Pennsylvania Game Commission, president; Harry Lutz, Kansas, vice president; and Ed Dolger, California Department of Natural Resources, secretary and treasurer.

Atlantic and Gulf Coast Fish Guide Available

A popular 24-page colored guide to the most common and interesting fishes of the Atlantic and Gulf Coasts from Cape Hatteras to the Mexican border is available from the Caribou Press, Box 236, Bronxville, New York, for 50 cents, the Wildlife Management Institute reports.

Wildlife Essay Contest Winner Being Sent to Nature Camp By Garden Club

Helen B. Walker, a student in the eighth grade at the Maury High School in Norfolk, who won a $15. cash award in the seventh annual Wildlife Essay Contest, will also be the recipient of a two-weeks all-expense session at the Nature Camp near Vesuvius sponsored by the Garden Club of Norfolk.

The Nature Camp is on Big Mary's Creek in the George Washington National Forest, three and a half miles from Vesuvius, in a beautiful little valley between the McClung and Mine Mountains. It is a project of the Virginia Federation of Garden Clubs designed to arouse interest in our renewable resources.

"Tell me, boy . . . do the fish in this creek know you personally?"

The camp is for young people interested in nature study who have leadership ability and are high-type, well-rounded individuals. It is not operated for profit and the staff members, specialists in various fields of conservation, donate their services.

Daily field trips are conducted by instructors to give opportunities for the observation of birds, insects, wildflowers, other plant and animal life. Personnel include men from the Virginia Forest Service, the Virginia Commission of Game and Inland Fisheries, and Rangers of the George Washington National Forest, who give lectures and conduct field trips, and conservation problems are discussed by outstanding educators.

An adult camp for ladies is held June 12-19 if a minimum of 40 members is enrolled. Boys and girls in the 10th, 11th and 12th grades will be at the camp June 20-July 3. The session for the 7th, 8th and 9th grades is July 4-17; for the 5th, 6th and 7th grades, July 18-31; and for grades 4, 5, 6 from August 1-14. For additional information, those who are interested should write to the Executive Director, Mrs. Fred Schilling, Avon, Virginia.

"Those of the Forest"

Wildlife enthusiasts will be pleased to know that Wallace Byron Grange has written another valuable book on the elements of ecology in the outdoor world. "Those of the Forest" is a narrative of wilderness lives, focussed most closely upon the snowshoe rabbit, but covering the lives of nearly every other creature in the forest—deer, ruffed grouse, mink, songbirds, hawks, owls, fishes, beaver, turtles, even parasites and bacteria.

Not the smallest detail in the life of one forest creature is unrelated or unimportant to the lives of all the others and the story is at all times biologically sound. There is no human being in the book, since it is a story of natural events that are independent of man. Written with deep understanding and sensitivity, "Those of the Forest" takes the reader through the forest and back through the annals of geological time.

Published by the Flambeau Publishing Company of Babcock, Wisconsin, this 314-page book brings new understanding and perspective to readers.

Wildlife Questions and Answers

Ques.: Can fishing licenses be obtained from the Commission of Game and Inland Fisheries?

Ans.: No fishing licenses are not sold at the Commission offices, but may be secured from the offices of the clerks of the circuit courts of the counties and the corporation courts of the cities, and from other authorized agents of the Commission of Game and Inland Fisheries.

Ques.: How long have dog licenses been required in Virginia?

Ans.: Since the Act of the General Assembly of March 22, 1920, licensing has been compulsory for dogs over four months of age. There had been scattered local regulations before that time.

Ques.: What sort of food do tadpoles eat?

Ans.: Tadpoles feed primarily on algae and other vegetation, supplemented by small aquatic insects and other animal food. After the tadpole becomes an adult frog, it becomes carnivorous, eating such small creatures as insects, crawfish, snails, worms, spiders, etc.

Ques.: Is there just one species of carp?

Ans.: No, there are three: the regularly scaled form, the mirror carp which has two or three irregular rows of large scales along the back, and the leather carp which is scaleless.

Ques.: I have heard that fishing west of the Blue Ridge has been closed because of last year's drought. Can you tell me if this is so?

Ans.: Only the streams of the Shenandoah National Park have been closed to fishing during the 1954-55 season as a result of last year's drought. No streams under the jurisdiction of the Commission of Game and Inland Fisheries have been closed.

Ques.: Is the State Game Farm open to the public?

Ans.: Yes, it is open to the public, but appointments should be made for visiting it by writing Mr. Dennis Hart, Manager, Cumberland Game Farm, Cumberland, Virginia.

Ques.: I have a friend who owns a private pond and has offered to furnish pickerel for stocking my pond. Is any sort of permit required?

Ans.: Yes, your friend should first secure a permit from the Commission of Game and Inland Fisheries in Richmond.

Ques.: Is it necessary to have a license for surf fishing?

Ans.: No license is required for surf fishing.

Ques.: Does the Game Commission furnish duck foods?

Ans.: At the present time the Commission does not have duck foods which it can furnish you, but it may be possible to recommend certain plants and suggest a source of supply.

Ques.: Can you tell me how long the incubation period of the cardinal lasts?

Ans.: Yes, the incubation period of the cardinal is 12 days.

Ques.: How may I secure tags to tag some young opossums before they are released?

Ans.: Dr. H. S. Mosby, Virginia Cooperative Wildlife Research Unit, Blacksburg, Virginia, may be able to let you have some tags if you write and explain why you would like to have them.

Ques.: I know that to use the expression "enough to keep a bird alive" to mean a very small diet is inaccurate, but I would like to have a more definite idea of the proportion of food eaten to the size of birds.

Ans.: Birds eat tremendous quantities of food in proportion to their size, many of them consuming half their weight in food every day while young birds frequently eat more than their weight in food a day.

Ques.: What is the minimum requirement for a non-resident fishing license to fish in public inland waters of Virginia?

Ans.: All non-residents regardless of age are required to have a fishing license which costs $10. Only residents under 16 can fish without a license. Effective July 1, 1954, the law has provided that non-residents may be issued a 3-day consecutive fishing trip license which costs $1.50, good only on public impounded waters not stocked with trout. Also available for non-residents is a 3-day reciprocal fishing license in the John H. Kerr Reservoir.

Ques.: How may I secure trout for stocking a stream on my property?

Ans.: Trout can be obtained free of charge for placing in private waters by sending an application to the United States Department of the Interior. Fish and Wildlife Service, Peachtree-Seventh Building, Atlanta 5, Georgia.

Ques.: What is the largest known reptile at the present time?

Ans.: The leatherback, a marine turtle, is the largest reptile of modern times. Specimens have been recorded that weighed almost 1500 pounds and measured eight feet in length.

Ques.: Is gigging allowed in the Shenandoah River?

Ans.: No. The Act of 1940 which permitted gigging in the Shenandoah River, in Page, Shenandoah and Warren counties, was repealed effective July 1, 1954.

Ques.: Do great horned owls catch many skunks?

Ans.: Yes, many skunks are captured by great horned owls and nearly every one of the birds which is killed is highly scented from this particular prey.

Ques.: Is the paint on the shells of the little turtles commonly sold in the stores and at carnivals harmful to the animals?

Ans.: Yes. The turtles sold in stores are usually little map turtles and the paint should be removed from their shells as soon as possible, for it may kill or stunt them, causing their shell development to be warped.

Ques.: Is it possible to secure a permit from the Game Commission to keep two gray squirrels in captivity?

Ans.: No, it is against the policy of the Commission of Game and Inland Fisheries to hold any game animal in captivity as a pet and, since the gray squirrel is not known to breed in captivity, no permit may be issued.

Essay Contest Winners Have Big Day

May 5 was a big day for the eight grand prize winners in the seventh annual Wildlife Essay Contest.

As special guests of the Commission and the Izaak Walton League, the top contestants were given an all-expense trip to Richmond. Governor Stanley presented the awards.

The essay contest has been an annual affair for seven straight years. Some 75,000 school pupils over the years have learned about conservation as a result of the contest.

Wildlife Essay winners, parents, commissioners, Waltonians and Game Commission staff members taking a Capitol tour guided by Official Hostess Mrs. Trant.

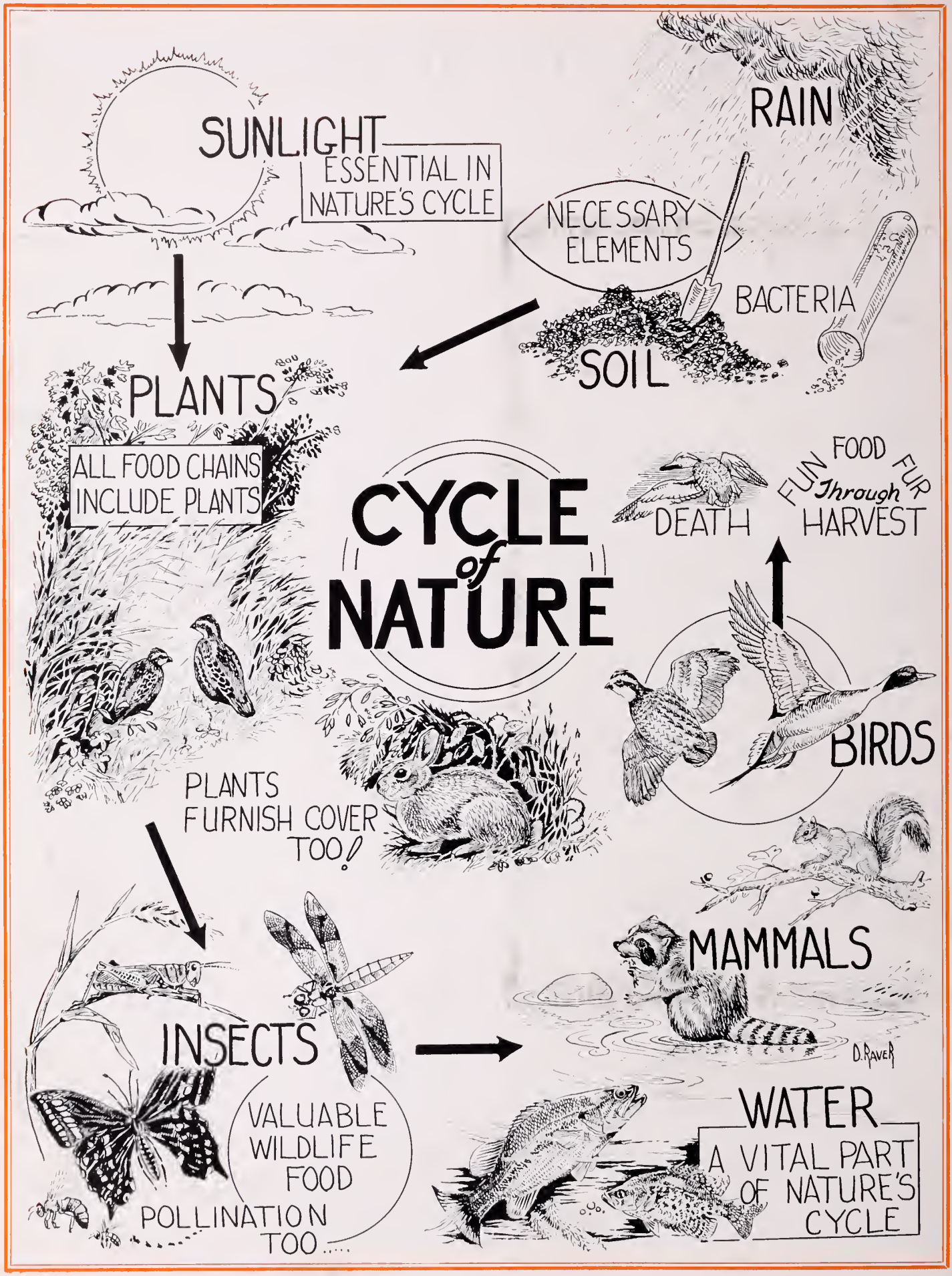
Governor Thomas B. Stanley making the presentation of a $50 check to Benjamin Hawkes of the Blackstone High School, Nottoway County, for his eighth grade essay.

Governor Stanley, with Mr. Peters, I. T. Quinn and Dowell J. Howard, and winners Edward Casper, Jimmy Carlton Nunn, Russell Pennington, Benjamin Hawkes, Lonnie Lee Smith, Patty Davis, Betty Jane Riddle and Judith Nicholas.

Dowell J. Howard, State Superintendent of Public Instruction, addresses the group assembled in the Senate Chamber for the presentation of awards.

Paul O. Peters, of Arlington, and Art Thompson (standing), of Norfolk, with grand prize winners Betty Jane Riddle, Lonnie Lee Smith and Judith Nicholas.

Commissioner Holman Willis, Jr., of Roanoke, addresses luncheon guests at the roof garden of the Hotel Richmond. Also at the speakers' table, Miss Evelyn Paris, Reynolds Harnsberger and Dowell J. Howard.


CYCLE of NATURE
SUNLIGHT
ESSENTIAL IN NATURE'S CYCLE
RAIN
NECESSARY ELEMENTS
BACTERIA
SOIL
PLANTS
ALL FOOD CHAINS INCLUDE PLANTS
DEATH
FUN FOOD FUR
Through
HARVEST
BIRDS
PLANTS FURNISH COVER TOO!
MAMMALS
D. RAVER
INSECTS
VALUABLE WILDLIFE FOOD
POLLINATION TOO.....
WATER
A VITAL PART OF NATURE'S CYCLE